

*Happy
Holidays*



Cory Passes Test

You could almost hear the Hallelujah chorus singing of another miracle following the successful completion of another technician test. This wasn't just any test, but that of eight year old Cory Vergara, KB9OXU. After nearly a year of trying the Clark Elementary School student passed the final element of his No-Code Technician test at the November VE session. For his supporters it wasn't the passing grade that harkened of a near miracle, but the fact that Cory had the desire to stick with it and keep taking the test until he passed. Cory began his quest for the Amateur Radio license while attending the first grade. He expressed a desire to be a ham like his mom and dad. Joe Vergara, KA9ZPA and Karen, N9KMH say Cory often

talks about learning the code and passing his General Class license so he can talk around the world on CW. Cory's new license completes the Vergara family of Amateur Radio operators. Their teenaged son Jesse, KB9NZB earned his Tech license earlier this year. According to Joe, quiet Cory has become a regular "Rag Chewer". The first evening Cory had his license he caused a pile up using Joe's six-meter equipment. Three different stations in Portland, Maine were vying for the new hams attention. Joe says Cory handled all three and went looking for more while calling "CQ six-meters". Congratulations Cory and to the entire Vergara family.

Free Donuts

Now that I have your attention. Join us for a morning of fellowship and toast a glass of milk or juice to one of the best Amateur Radio clubs in America. We will have plenty of coffee and donuts to go around. Our special guest speaker is Roger Lowery, W9BZ. Roger is a club member with a keen interest in antique radios. He will be showing some of his favorite collectables and talking about the "good ole days" of ham radio. Since there is no testing immediately following the meeting we'll have plenty of time for questions and socializing. Video tapes of past field days will be available for viewing. —MARC

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Antenna Party a Success

SPARK GAP

Editor

Jack F. Parker Sr., NT9J

6 Summit Ridge Court

Greenwood, In. 46142

H 317/881-0817

Packet NT9J@KB9LOC 145.63 Mhz

E-mail jparker@iquest.net

Publisher

Anna Leser

Johnson County EOC

O. 736-9064

Mailing & Circulation

Vernon Gill, N9QBO

H. 738-4575

Membership Information

The Mid-State Amateur Radio Club is a Franklin based organization open to all amateur radio operators in central Indiana.

The MARC meets the third Saturday of each month in the training room of the Johnson County Emergency Operations Center at 1100 Hospital Road in Franklin, In.

The MARC operates a 2-meter repeater at 146.835 MHz. Each club member has free access to the repeater and autopatch.

Annual membership is \$18.00. VE Testing follows each meeting from March through November.

Submit stories to the editor on disk or via e-mail by the 3rd of each month.

Send change-of-address information and membership applications to the club treasurer @ MARC President, P.O. Box 836, Franklin, In. 46131.

The Spark Gap is published monthly by the Mid-State ARC.



CLUB OFFICERS

President :

Dennis Parton, KB9HPQ

H. 535-5867

Vice President:

George Weimer, KG9HU

H. 882-5081

Secretary:

Marilyn Parton, N9TUK

H. 535-9910

Treasurer/ARES:

Vernon Gill, N9QBO

H. 738-4575

RACES Director:

Lee Porter, KB9KDK

H. 786-6234

Repeater Trustee:

Dave Julian, WB9YIG

H. 887-9504

Activities:

Jack Parker, NT9J

H. 881-0817

VE Team Coordinator

Dave Wendt, KA9OOH

H. 974-1488

Club Meeting
Saturday December 21st
8 a.m.
Guest speaker, Roger Lowery, W9BZ
Topic: Antique Ham Radios
No VE Testing



Weather Facts

By Mike Rosemark, KA9VMR

NWS Meteorologist

Meteorology -

The Science Of Meteors

Meteorology is the study of the atmosphere and its phenomena. The term itself goes back to the Greek philosopher Aristotle who, around 340 BC, wrote a book on natural philosophy entitled *Meteorologica*. This book contained information on the current knowledge of weather at the time. It also contained information on astronomy, geography, and chemistry. Specific weather topics covered in this writing included the latest thinking on clouds, rain, snow, wind, hail, thunder, and hurricanes. During that period, anything that fell from the sky, and anything seen in the air, were called meteors, hence the term meteorology. Today, we differentiate between those meteors that fall from sources outside the atmosphere (meteoroids) and particles of water and ice observed in the atmosphere (hydrometeors).

In *Meteorologica*, Aristotle attempted to explain atmospheric phenomena in a philosophical and speculative manner. Even though in modern times many of his speculations have been found to be erroneous, his ideas were accepted without question for almost 2000 years. The birth of meteorology as we know it today did not occur until the mid to late 1600s when weather instruments, like the thermometer,



barometer, and hygrometer were invented. Once observations from instruments were available, attempts were made to explain atmospheric phenomena through scientific experimentation and physics being developed at the time.

The science of meteorology steadily progressed as better instrumentation was developed in the 1800s. The invention of the telegraph provided a tremendous boost to the understanding of the atmosphere. This early mode of real time communication over long distances allowed the transmission of routine weather observations. Ideas about storms became better understood and early weather maps could be drawn.



The concept of air masses and fronts were better defined by the early 1900s with the addition of data from upper air observations obtained from kites and balloons. Meteorology took another

step forward in the 1950s when high speed computers were developed to solve complicated mathematical equations used to describe and predict atmospheric conditions. The early 1960s saw the introduction of weather satellites which could monitor atmospheric conditions from space.

Meteorologists of today are using more powerful computers, advanced atmospheric monitoring systems, and high speed communications systems to monitor and predict weather conditions around the globe. Progress doesn't stop here however. New and even more advanced instrumentation is on the horizon. Combining this with on-going meteorological research will certainly result in more accurate forecasts and warnings for the future.

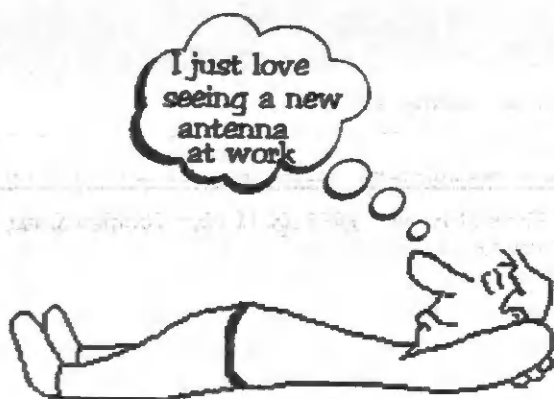
A NOTE OF THANKS--Goes to Mike Rosemark, KA9VMR, for his regular contributions to the *Spark Gap*. Mike's monthly articles about meteorology and weather facts have continued to give our newsletter valuable information and interesting facts about the ever changing world of weather. --Editor.

EOC gets AM/FM & Six Meter Radio

After months of planning, or should I say procrastination, the EOC receive antenna project is now complete. A new Discone antenna has been installed on the roof of the Law Enforcement Building to provide better AM/FM reception to the Emergency Management Office. The project was proposed over a year ago. Its purpose was two fold. One, to provide better radio reception in the basement and two, to eliminate extraneous antennas being mounted on the Cushcraft R7 located on the roof. The R7 antenna is used with the HF radio. Building "do-it-your-selves" had been using the vertical antenna as an all purpose mounting pole for their antennas. A self standing tripod base with 10 foot mast now holds the Discone antenna. An amplifier and antenna leads have been run to the Emergency Management Office, the building maintenance man's office and to the club RACES radio room.

A first class job

Seven hams worked six hours to pull cable and install the equipment. Terry Grubb, N9YLJ provided three 40-pound steel plates as anchors for the tripod base. Bill Brinkmann, KA9ZMU, spent most of the morning on his stomach in the dispatch radio equipment room locating conduit runs and feeding cable through the building. Over 300 feet of RG 59 cable had to be run across the false ceilings, through the walls and then fed from the basement to the roof. An additional 400 feet of RG 213 coax was run from the club radio room to the roof for a six meter antenna. A tripod base and mast need to be purchased and installed on the roof to complete that project. It took all seven hams working in unison to snake the coax through the building. Assisting were Dave Dailey, KB9LOT; Brian Davis, KG9DU; Vernon Gill, N9QBO; Lee Porter, KB9KDK; Dennis Parton, KB9HPQ; and Jack Parker, NT9J. Brian was in charge of adding connectors where needed. He took a good jolt of electricity when he came in contact with a defective electrical box in the upstairs storage area. That was one of several maintenance and safety items that the group discovered while crawling through the building. Lee Porter made a list to be passed along to the building maintenance people. Our thanks to everyone involved for a job well done. -MARC



RACES post vacated

In a move to avoid any conflict of interest, Lee Porter, KB9KDK has resigned as RACES Director for Johnson County. Lee accepted a part-time position with the Johnson County Emergency Management Agency. He is assisting Emergency Management Director Sam Williams with disaster planning. Expanded duties keep Lee quite busy attending meetings and training sessions throughout the state. Lee will continue to be a RACES member and represent Amateur Radio operators on the Local Emergency Planning Committee. We wish Lee well in his new position.

Vernon Gill, N9QBO has been appointed acting RACES Director. Vernon is the ARES Director for Johnson county and has been working closely with Lee and Sam to better organize the Amateur Radio response to emergencies in the county. If you are interested in filling the RACES Director position contact Lee Porter or Sam Williams at 736-9064. -MARC

'97 DUES

Mid-State ARC Treasurer Vernin Gill, N9QBO, will begin accepting dues for the 1997 year at the December 21st meeting. The \$18.00 fee is payable via cash or check to the Mid-State ARC. Each club membership includes phone patch privileges in and around Johnson county, a monthly newsletter and occasionally a free donut and cup of coffee. All fees are used to maintain the club repeater and promote club activities like Field Day and the annual fall picnic. Dues may be mailed to: Mid-State ARC, P.O. Box 836, Franklin, In. 46131.

PL tones made easier

by Larry Kirby, KA4MWP

What does "PL" mean? It's an acronym for Private Line, Motorola's trademarked continuous-tone-controlled squelch system (CTCSS). Competing names include Quiet Channel and Call Guard. But let's call all such systems "CTS". When you "open" your radio's squelch control, you hear a rushing sound, a combination of receiver front-end noise, solar noise, man-made noise, etc. The squelch circuit in your receiver samples this noise. When you rotate your squelch control clockwise, at a certain point the noise stops. At that point, the level the control sets matches the noise. Further clockwise rotation "closes" the squelch system, shutting down the audio except for signals stronger than whatever level you set.

With the squelch closed, the radio is still receiving, but you hear nothing until a signal comes on that is stronger than the level you've set. A strong enough signal "opens" the squelch, turning the audio on, so you can hear the signal's modulation. Squelch eliminates that rushing noise when there's no signal on frequency. Years ago, rather than let any random signal bring up a repeater, some hams used "whistle up". The repeater's control circuits required a certain tone frequency before it would turn on the repeater's transmitter. To hit the right tone, you whistled siren-like into the mike until the repeater came on. And of course, if you matched the tone right away, everyone heard the rest of your whistle.

Technology marches on. Some inventor gave the transmitter the required tone. So the radio had to transmit the tone each time you keyed up. The process became known as "tone burst". Some European countries still use this method, and as recently as five years ago, some radios offered tone burst as an option.

Today's systems keep the tone there all the time -- continuous-tone-coded squelch. A constant 1750 Hz tone would be annoying to say the least, so designers made use of the fact that most speech audio falls between 500 and 2500 Hz. They put the tone frequencies well below that range "subaudible tone", also called CTS. Many receivers feature a built-in "high-pass" filter that removes the tones from the received audio. If we want to hear only certain people, groups, club members, or repeaters when they are on a frequency, we assign the group the same tone frequency to send (encode) and receive (decode). Others on the frequency can avoid being bothered by

our chatter by using different tone frequencies. Neat huh? Commercial two-way radio companies have long used this system, which allows several groups of customers to share a repeater. The companies even set up a standard set of 39 CTS tones.

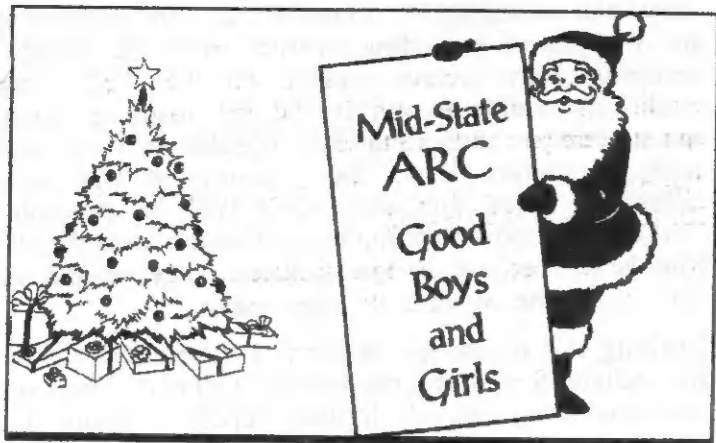
The most common used by local ham repeaters are 88 Hz, 100.0 Hz, 179.9 Hz.—Ed.

With the RF spectrum getting ever more crowded, we began to experience interference on our radios and especially on our "high-profile" repeaters. To avoid mutual interference, repeater frequencies are not reused in the same locales, but the growing number of repeaters still causes problems. Putting the repeaters on CTS, using different tone frequencies, can help. But older radios can't memorize CTS tones and associate those tones with selected channels. One way to minimize the difficulty is to put all the repeaters in a given city on the same CTS tone. So CTS is worth having, for many reasons. It's especially useful in crowded cities, but even in uncrowded areas it's nice to be able to monitor a frequency or repeater and hear only those people you choose to hear. *from the Central Ohio ARES bulletin (Columbus, Oh.)*

Repeater Update

According to repeater trustee Dave Julian, WB9YIG, the club repeater is operating at near normal power, 45 watts. He had to re-install the old amplifier. The new amp is being sent back to the manufacturer. It apparently draws too much current for the power supply and shuts down. Still on order is the PRC 16 controller. It was expected in September but a manufacturing design flaw has put the distribution on hold. Dave is hopeful it will arrive by the first of the year.

One new addition: Dave has put a 100 Hz PL tone on the transmitter, only. If you set your radio to receive the 146.835 Mhz repeater with a 100 Hz tone it will eliminate the intermod problems experienced when driving through downtown Indianapolis and other areas in central Indiana. Dave believes there is a problem with the duplexers. He expects to have that checked out by the end of December. Unfortunately, Dave's employer has had him on the road out of state recently leaving him with little extra time to work on the repeater. We may have an update at the December club meeting. —MARC



With Christmas just around the corner your favorite club newsletter compiled a wish list for Santa from good ham radio girls and boys.

Del Middleton, K9ZON, A Cadillac and a couple of new radios.

Marilyn Parton, N9TUK... Would like my daughter and her family back from China.

Chuck Crist, WB9IHS I want a video editing setup so we can edit all the Windtrax tapes.

Paul Roman, KA9PPG... A new computer set up, general class license and new radio to use on the low bands.

Bill Brinkmann, KA9ZMU... New dual band radio for my new truck.

Gayla Davis, N9WKV... QSL cards

Bill Bennett, KG9DR... New Icom 756 HF rig

Jack Parker, NT9J... Need Santa's Elves to tune up my tri-band HF beam and install it on my tower.

Brian Davis, KG9DU... Hand mic for Kenwood 530

Bob LeGrange, N9SIU... Icom 736 HF Rig

Herschel Saylor, WD9GMM... Amateur TV equipment.

Ellen Weimer, KB9NZC... Crash course to learning Morse code.

Joe Rogers, KF9LQ... A coffee mug with Mid-State ARC on it.

Vernon Gill, N9QBO... Mobile six meter radio.

George Weimer, KG9HU... An electronic Keyer.

Kim Miles, KB9JQO... A HF antenna that points in the direction of Texas.

Rocky Bundy, KB9LWM... A set of VHF and UHF beams.

Barbara Rice, KB9NOG... A good Snowfall.

Christmas Candy Raffle

Nine and a quarter pounds of candy is a lot of Christmas chocolate. But, thanks to Rick Reneau, KB9NDF and a local corporate sponsor, someone will take home a giant size Nestle Crunch Bar. Club members have been selling the two dollar raffle tickets since the November meeting. The winner of the TV-tray size candy bar will be selected at the December 21st meeting. You do not have to be a ham to win. All proceeds will be put into the general fund for club activities. Contact Rick Reneau at 780-1803 if you know of someone that is interested in winning a 27,000 calorie candy bar. Again, tickets are \$2 or 3 for \$5.00.

FEMA defends hams

The Federal Emergency Management Agency better known as FEMA is saying no to sharing or reallocating the 2 meters and 70 centimeter ham bands to Low Earth Satellites. In a letter to the FCC task force currently evaluating new spectrum for use by LEO satellites, FEMA Manager Paul Reed, tells the committee that his agency opposes any such change. Reed says that Amateur Radio operators have a history of supporting state and local government emergency operations by providing needed communications. He says that many local communities served by ham radio have extremely limited resources and would be without any form of back-up communications without Amateur Radio. Reed says that FEMA has been in contact with its state and local emergency management partners across the nation. That it is their belief that authorizing access to the mobile satellite service in the 2 meter and 70 centimeter bands will seriously degrade the ability of these groups to support their public service requirements.

The FEMA Manager ends his letter by strongly urging the FCC task force to remove both of these ham bands from any further consideration as a new home for Low Earth Orbiting Satellites. He says to leave them for use by ham radio and its emergency service partners, nationwide. -- *Newsline*

Oscar Dies

OSCAR 13 has been declared dead. In late November OSCAR 13's solar panels began to fail as the satellite's degrading orbit brought it into the upper reaches of Earth's atmosphere. System voltages began to plummet, and at 0538 UTC on Sunday, November 24, the satellite ceased to function. OSCAR 13 is expected to re-enter and burn up in Earth's atmosphere. The satellite had spent just over 8 years in space.--Amsat News Service

In my opinion

It's time to add PL tones to our club repeater. It's time to take control and make the 146.835 Mhz repeater responsive to the needs of the club users and not be a slave to seasonal atmospheric changes. The only way to safely control the input signal is to add PL (private line) tones to the receiver and transmitter. Unfortunately this will not stop malicious interference from lame-brained hams wishing to test their PTT switch. Only a sledge hammer making an adjustment to their radio could solve that problem. But, it is possible to eliminate the majority of stray signals that cause the biggest kerchunking problems.

PL tone access is the answer. Of course there are drawbacks any time you restrict access to a club repeater. First, there is always someone with an antique radio that, like me, never spent the extra \$40 bucks to get a tone board. I confess, three years ago I heeded the advice of my ham colleagues at work and joined the 21st century by adding a tone board to my mobile radio. It has been a worthwhile investment. Now I can access any repeater anywhere, including the one we use at work. The most troubling

drawback to adding PL tones to our club repeater is the thought of excluding visitors from the friendly reception they always receive on the '835. That exclusion could be eliminated by using a voice announcement indicating the repeater is open and tone accessible. With the addition of our new controller voice announcements will be possible. Fortunately, most new radios now come with the PL tone boards as part of the package. They've had to. The rest of the world is PL tone ready.

Making this transition easier is a recent decision by the Indiana Repeater Coordinating Council. They are recommending that all Indiana repeaters adopt the system used in adjoining states. That system has all repeaters tone accessible using a common area code, so to speak. An example, all repeaters south of Indianapolis would use 88.5 Hz. This will allow same-frequency repeaters in a region to operate without interference.

My recommendation: As soon as we get the new A/D Technologies controller on line we begin Phase One by switching to PL access part time when atmospheric conditions cause problems. That policy would be more acceptable than having one of the repeater trustees turning it completely off for half the day. A dead repeater serves no one. Phase Two would make it a full time PL tone access repeater by late June 1997. This would give most of us time to buy the appropriate equipment. The time has come to make a change for Amateur Radio and for the future of the Mid-State Amateur Radio Club repeater.
--Editor

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(RED MAILBOX)

Hams find Space home

A foundation has been laid to give Amateur Radio a permanent presence in space. Amateur Radio delegates from eight countries met at the NASA Johnson Space Center in Houston, Texas, to map plans to include a permanent ham radio station aboard the International Space Station, to be tended by station crew members. From the United States, members of the SAREX Working Group, officials from NASA, US representatives of the Russian Mir Amateur Radio experiment and members of the Johnson Space Center Amateur Radio Club attended the meetings chaired by Roy Neal, K6DUE. The delegates jointly developed a draft memorandum of understanding to promote the development of Amateur Radio on the International Space Station.